

Global Product Strategy (GPS) Safety Summary

Gamma Butyrolactone

This GPS Safety Summary is a high-level summary intended to provide the general public with an overview of product safety information on this chemical substance. It is not intended to provide emergency response, medical or treatment information, nor to provide an overview of all safety and health information. This summary is not intended to replace the Safety Data Sheet. For detailed guidance on the use or regulatory status of this substance, please consult the (Material) Safety Data Sheet and the Regulatory Affairs Bulletin (RAB).

Chemical Identity

Name: Gamma Butyrolactone
Brand names: GBL, γ -butyrolactone
Chemical name (IUPAC): Oxolan-2-one
CAS number: 96-48-0
EC number: 202-509-5
Molecular formula: C₄-H₆-O₂

Uses and Applications

Gamma Butyrolactone (GBL) is used as a solvent component in industrial and professional cleaning formulations, binders and release agents, inks and toners, small batteries and capacitors, and agrichemical formulations. Industrially, it has uses in the production of polymers in batch processes. It is also used in laboratory settings.

There are no supported uses of GBL in direct consumer products or applications .

Physical / Chemical Properties

GBL is a colourless liquid with little odor at room temperature. The substance is not considered flammable with a flashpoint of 106°C (223°F) The boiling and freezing points of GBL are 205°C (400°F) and -44°C (-47°F) respectively.

Health Effects

GBL has low to moderate acute toxicity by the oral route. The compound has been found to cause severe irritation to the eyes and can cause drowsiness when ingested or inhaled. GBL is readily absorbed through the skin and via oral exposure or respiration. Based on these health effects, GBL has been classified under GHS (Globally Harmonized System on Classification and Labeling) as hazardous.

The table below gives an overview of the health effects assessment results for GBL.

Effect Assessment	Result
Acute Toxicity Oral / inhalation / dermal	Low to moderate toxicity via the oral route of exposure. Can cause drowsiness or dizziness when inhaled. GBL is rapidly absorbed and metabolized to Gamma-Hydroxybutyrate (GHB) which is thought to produce the neurotoxic effects of GBL.
Irritation / corrosion Skin / eye/ respiratory tract	Can cause irreversible corrosive damage to the eyes and can be irritating when inhaled.
Sensitisation	Not sensitising
Toxicity after repeated exposure Oral / dermal	Repeated exposures of rodents to high doses resulted in sedation, body weight decreases and reduced survival.
Genotoxicity / Mutagenicity	Not mutagenic.
Carcinogenicity	Not considered as carcinogenic.
Toxicity for reproduction	Not toxic to reproduction or development.

Environmental Effects

GBL is a low ecotoxicity hazard based on short and long term test results in fish, aquatic invertebrates and plants.

The table below gives an overview of the environmental effects assessment results for GBL.

Effect Assessment	Result
Aquatic Toxicity	Low ecotoxicity hazard to aquatic organisms.

Fate and behaviour	Result
Biodegradation	Readily biodegradable
Bioaccumulation potential	Not bioaccumulative
PBT / vPvB conclusion	Not considered to be either PBT nor vPvB.

Exposure

Human health

Workers may be exposed to GBL during activities such as product transfer, packing and repacking, formulation, laboratory activities, or during use as a component in professional or industrial products like cleaning agents and agrochemicals. For such activities exposure should be controlled by selecting and applying the appropriate Risk Management Measures.

Exposure to GBL in manufacturing facilities where GBL is used as a chemical intermediate or process chemical is considered low because the process, storage and handling operations are usually enclosed. However, worker exposure can potentially occur during operations like product transfer, product sampling, or maintenance / repair activities on product containing systems. The

risk of accidental exposure should be controlled by selecting and applying the appropriate Risk Management Measures.

Environment

Due to its many industrial and professional uses, GBL has various indoor and outdoor environmental release possibilities, although the volumes released are expected to be small. As GBL is readily biodegradable and not bio-accumulative, it is not expected to be found in the environment.

Risk Management Measures

For detailed guidance on the use of GBL, the [\(Material\) Safety Data Sheet](#) should be consulted.

GBL should only be handled by knowledgeable and trained personnel.

Flammability

Equipment should be grounded to prevent build-up of static electricity.

Human health

When using chemicals make sure that there is adequate ventilation. Always use appropriate chemical-resistant gloves to protect your hands and skin, always wear eye protection such as chemical goggles and always wear flame-retardant clothing. Do not eat, drink, or smoke where chemicals are handled, processed, or stored. Wash hands and skin following contact. If the substance gets into your eyes, rinse eyes thoroughly for at least 15 minutes with tap water and seek medical attention.

In the case of transfer or maintenance operations, always clear transfer lines prior to decoupling, and flush/drain to a closed system for recycle prior to opening equipment.

In cases where engineering controls cannot maintain airborne substance concentrations below exposure limits, or in cases with a risk of accidental exposure, additional risk management measures may be necessary for safe use, such as the use of a complete suit protecting against chemicals and supplied air, a self-contained breathing apparatus or a respirator.

Environmental

In case of accidental release or spill do not allow the product to enter sewers, surface or ground water.

Regulatory Information / Classification and Labeling

This substance has been registered under REACH by relevant companies of LyondellBasell in the European Union.

In the United States, the sale and distribution of GBL may be regulated by federal and/or state authorities. In Europe, GBL may be similarly regulated following Country specific requirements. Other Countries outside of the United States and Europe have also begun to implement specific

requirements. Requests for GBL will be reviewed and approved by LyondellBasell as appropriate. LyondellBasell will report questionable requests for GBL, including samples, as applicable to the Drug Enforcement Agency, or to the European Country Authorities and other relevant agencies.

For a detailed overview of the regulatory status of this substance, please refer to the [Regulatory Affairs Bulletin](#), which is available from the LyondellBasell corporate website.

Under GHS (Globally Harmonized System on Classification and Labeling) substances are classified according to their physical, health and environmental hazards. The hazards are communicated via specific labels on the product packaging and the Safety Data Sheet. GHS attempts to standardize hazard communication so that the intended audience (workers, consumers, transport workers, and emergency responders) can better understand the hazards of the chemicals in use.

For a detailed overview of the classification and labeling of this substance, please refer to the regional [\(Material\) Safety Data Sheet](#), which can be found on the LyondellBasell corporate website.

Conclusion Statements

- GBL is a versatile solvent with numerous applications in industrial applications, as well as several professional products including ink/toners, cleaning formulations, binders, and agricultural formulations. It is also used in the production of polymers.
- GBL is a non flammable solvent, is of low to moderate acute toxicity by the oral route, and can cause severe irreversible corrosive effects in case of eye contact. It can cause drowsiness at high concentrations. GBL possesses narcotic properties and, to prevent abusive use, its sale and use must be strictly controlled and documented. Appropriate Risk Management Measures should be selected and applied to control risk of exposure.

Contact Information within Company

For further information on this product in general, please consult the [LyondellBasell corporate website](#).

For specific Product Safety related questions, please contact PSInfo@lyondellbasell.com.

Date of issue

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Disclaimer

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Users should review the applicable Material Safety Data Sheet before handling the product.

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